

# **AUDIO SIGNAL ADAPTOR**

## **BACKGROUND OF THE INVENTION**

### **1. The field of the invention**

[0001] The present invention relates to an audio signal adaptor having an optical  
5 conversion function, and more particularly, relates to an audio signal adaptor comprising  
a space to receive an optical conversion module to achieve both telephony signal and  
optical signal transmission functionalities.

### **2. Description of the related art**

[0002] In recent years, the adaptor that controls the sound signal in the multimedia  
10 system can only receive the audio plug for telephony signal transmission, and when  
processing the signal transmission by such audio plug, the electromagnetic interference  
can cause the distortion of signal. Accordingly, some manufacturers proposed to use  
optical fiber for processing signal transmission. The optical fiber is composed of  
fiberglass material, capable of transmitting optical signals. A thin fiberglass is capable of  
15 replacing a thick conventional cable, and the fiberglass has the advantages of high  
transmission efficiency and minimum distortion (due to non-existence of electromagnetic  
interference). Therefore, the fiberglass has taken a very important position in signal  
transmission technology. The appearance and size of the above audio plug and the  
circular type 1 plug are same, but the manufacturers usually classify these separately as  
20 independent set, thus the space occupation for these element on the circuit board will be  
correspondingly large, and the assembly work is also correspondingly. Furthermore, to  
suit the latest trend for electronic products being lighter, thinner and smaller to attract  
consumers, the circuit board within the electronic product has to be modified into smaller

size to meet such requirements. Further rapid advances in technology have led to development of additional features in the electronic products.

Accordingly, as can be seen, in the conventional art, separating the audio plug from the optical fiber plug cannot possibly meet the latest need and trends.

## 5 SUMMARY OF THE INVENTION

[0003] Accordingly, in the view of the foregoing, the present inventor makes a detailed study of related art to evaluate and consider, and uses years of accumulated experience in this field, and through several experiments, to create a new audio signal adaptor. The present invention provides an innovated cost effective audio signal adaptor.

10 [0004] The present invention provides an audio signal adaptor comprising a space for receiving an optical conversion module. The optical conversion element of the optical conversion module facing the adaptor of the audio signal adaptor allows the circular type 1 plug to fit into the adaptor to form an optical conversion loop with the optical conversion element.

## 15 BRIEF DESCRIPTION OF THE DRAWING

[0005] For a more complete understanding of the present invention, reference will now be made to the following detailed description of preferred embodiments taken in conjunction with the accompanying drawings, in which:

[0006] Fig. 1 is a perspective view of a an audio signal adaptor of the present  
20 invention;

[0007] Fig. 2 is an exploded view of the audio signal adaptor of the present invention;

[0008] Fig. 3 is a perspective view of an optical conversion module of the present invention;

[0009] Fig. 4 is an exploded view of the optical conversion module of the present invention;

5 [0010] Fig. 5 is a sectional side view showing before assembling of the audio signal adaptor of the present invention;

[0012] Fig. 6 is a sectional side view showing while assembling the audio signal adaptor of the present invention;

10 [0013] Fig. 7 is a sectional side view showing after assembling of the audio signal adaptor of the present invention;

[0014] Fig. 8 is a sectional side view showing the audio signal adaptor according to one preferred embodiment of the present invention; and

[0015] Fig. 9 is a sectional side view showing the audio signal adaptor according to another preferred embodiment of the present invention.

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## **DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS**

[0016] Reference will be made in detail to the preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

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[0017] Referring to FIG. 1, 2, 3 and 4, respectively show the perspective view and exploded view of the audio signal adaptor of the present invention, and the perspective view and exploded view of the optical conversion module of the present invention. As

shown in the figures, the audio signal adaptor **1** of the present invention comprises a connector **2** and an optical conversion module **3**.

[0018] The audio signal adaptor **1** comprises a plurality of adaptors **11** on one side, and a corresponding space **12** is disposed on another side apart from the adaptor **11**. A telephony signal terminal **13** is disposed within the space **12**. Furthermore, the audio signal adaptor **1** comprises a buckle **14** on a bottom surface.

[0019] The connector **2** comprises a button **21**, and a base **22** is formed on a side surface of the button **21** for penetrating and fitting a plurality of optical signal terminals **23**. The button **21** of the connector **2** further comprises a plurality of groove **211**. And the above optical signal terminals **23** has a bent supporting portion **231** formed on one side thereof. Additionally, on the two sides of frontal flange of the button **21** of the connector **2** are extended formed with a buckling portion **212**.

[0020] The optical conversion module **3** comprises a base **31**, which comprises a positioning hole **311**, and on the other side apart from the positioning hole **311** has a space **312** with protruded buckles **3121** formed on two sidewalls. An optical conversion element **32** is positioned in the space **312**. Furthermore, the protruded buckles **3121** formed within the space **312** of the base **31** can support the surface of the optical conversion element **32** for positioning, as shown in FIG. 4. The optical conversion element **32** comprises a side extended with a plurality of signal terminals **321** having bent contact portion **3211** at a distal end of each signal terminals.

[0021] Further, referring to FIGs. 5, 6 and 7, respectively show the sectional side view before assembling, the sectional side view while assembling and the sectional side view after assembling the audio signal adaptor of the present invention. To assemble the

audio signal adaptor 1 of the present invention, the telephony signal terminals 13 of the audio signal adaptor 1 is fitted into the plurality of grooves 211 formed at the button 21 of the connector 2, and the buckle 14 extending at the button flange of the audio signal adaptor 1 is resiliently buckled into the buckling portion 212 formed at the frontal flange of button 21 of the connector 2. Next, the base 31 of the optical conversion module 3 is inlaid into the space 12 of the audio signal adaptor 1. Meanwhile, the positioning hole 311 formed at the base 31 of the optical conversion module 3 is positioned facing the adaptor 11 of the audio signal adaptor 1. Correspondingly, the supporting portion 231 of the optical signal terminal 23 will have the electrical connection with the contact portion 3211 of the signal terminal 321. Furthermore, when the above assembly is completed, a case 4 fitted to cover the audio signal adaptor 1 for isolating the electromagnetic signal from the external signals.

[0022] Now referring to FIGs. 8 and 9, respectively show the audio signal adaptor according to one preferred embodiment, and according to another embodiment of the present invention. After the assembly of the audio signal adaptor 1 of the present invention, an adaptor 11 of the audio signal adaptor 1 is fitted into the circular type 1 plug 5, and the terminal of the circular type 1 plug 5 can be inlaid into the positioning hole 311 of the base 31 of the optical conversion module 3 to face the optical conversion element 32 for forming an optical conversion loop. The optical signal terminal 23 of the connector 2 is used for optical signal transmission. Furthermore, when the user inserts the audio plug 6, the telephony signal terminal 13 of the audio signal adaptor 1 can have the electrical contact with the audio plug 6 to enable the audio signal adaptor 1 to have the telephony signal transmission by the signal terminal 13.

[0023] While the invention has been described in conjunction with a specific best mode, it is to be understood that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations in which fall  
5 within the spirit and scope of the included claims. All matters set forth herein or shown in the accompanying drawings are to be interpreted in an illustrative and non-limiting sense.